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ABSTRACT

This is a progress report of the Demonstration of an Improved Science Curriculum for Underachieving Students (DISCUS) project for 1968-69. This project is based on the premise that if underachieving junior high school youth are separated from their more successful peers, placed in a success-oriented environment, and provided with a series of meaningful small group activities using a directed discovery approach, then one can improve their attitudes towards themselves, their teachers, and their schools. The data reported in this paper were obtained from 29 teachers teaching 34 DISCUS classes of 1,012 students and 33 teachers teaching 33 classes of 960 students which served as a control. The results of the study indicated that (1) a preferential treatment of disadvantaged students in success-oriented science classes does improve their attitudes toward school personnel and school, (2) without a hospitable classroom environment, the students' attitudes toward themselves, school personnel, and school deteriorates, (3) that involvement in relevant small group laboratory activities does enable disadvantaged students to continue to develop, and (4) that even as late as during the junior high school years it is possible to rehabilitate educationally disadvantaged underachievers. (LC)

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Paper, NARST Minneapolis Meeting, March 5-9, 1970

Subject. . . . A Demonstration of an Improved Science Curriculum for Underachieving Students, DISCUS, A Progress Report for 1968-69.

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Time . . . . . 12:40 p.m., Friday, March 6, 1970

Place. . . . . Leamington Hotel, Minneapolis, Minnesota

History:

The DISCUS program started with a "grass-roots" pilot project in one school involving three experimental teachers and classes during the spring semester of 1967 (1) (2) and has since expanded until at the present time there are more than sixty teachers teaching it in twenty different junior high schools. In most, but not all of these schools, there are control classes. A difficulty faced in our research program was that both teachers and principals in schools not included in the research program wished to use it, and since we were funded largely through Title I ESEA funds we were obligated to provide the program even though we did not have teachers adequately prepared to teach it.

In the continuation of DISCUS during the spring semester of 1968 (3), we obtained complete test data for some 850 students in the experimental group and a similar number in the control group. Additional materials were written and tested in this operation and this activity is being continued even now. It is planned to have a complete junior high science program developed and tested by the end of the current school year.

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Underlying the program is the hypothesis that if underachieving junior high school youth are separated from their more successful peers, placed in a success-oriented environment, and provided with a series of meaningful small group activities using a directed discovery approach while using the data from their activities in arriving at meaningful concepts via discussion techniques, that one can improve their attitudes towards themselves, their teachers, and their school. The results reported so far have indicated: 1) that a preferential treatment of educationally disadvantaged junior high school students in success-oriented science classes does improve their attitudes toward school personnel and toward the school 2) that without a hospitable classroom environment as provided in the DISCUS project, the students' attitudes toward themselves, school personnel, and toward the school deteriorates; the students "drop-out" of school until they can legally drop-out 3) that involvement in relevant small group laboratory activities in which students generate data, communicate about the data, and use the data in developing concepts does enable educationally disadvantaged underachievers to continue to develop in school and 4) that even as late as during the junior high school years it is possible to rehabilitate educationally disadvantaged underachievers who are potential drop-outs.

1968-69 Operation:

As previously reported and to the extent that it continued to be possible, the students and teachers were assigned to treated and non-treated classes on a random basis. Special instruction, as well as materials of instruction, was provided most of the teachers of treated classes through the DISCUS office.

The data reported herein were obtained from 29 teachers teaching 34 DISCUS classes of 1,012 students and 33 teachers teaching 33 classes of 960 students which served as a control. Only 18 of the 29 teachers teaching DISCUS classes had been specially prepared to teach them and regretably 2 of the 33 teachers assigned to control classes had been prepared to teach DISCUS classes.

The following tests were administered to both treated and non-treated groups as pre-tests and post-tests:

1) The Otis Quick-Scoring Mental Ability Test (4)

2) The Science Section of the STEP, Sequential Test of Educational Progress (5)

3) The Battle, J. A., Student Attitude Scale (6)
A score reflecting the student's attitude toward self, peers, teachers, and school was obtained.

4) A written Projective Essay in which the student wrote a paragraph on the topic, "A Teenager's Advice to the School". (Analysis was made of a random sample of paragraphs written.)

5) A Projective Interview (Picture Story Test) (7) (8). Only a random sample of the treated and non-treated students were interviewed.

The latter two tests were read and scored on a 0 - 9 scale as to attitude toward self, toward peers, toward teachers and toward school.

During the year, video tapes were made in 19 of the classrooms, a sampling of both the treated and the non-treated classrooms. These were analyzed by graduate students trained to use the systematic observation scales to gain evidence as to the kind of experiences provided in each classroom. The scales used were Brown's Teacher Practices Observation Record, TPOR, (9) which served as a measure of the nature of the classroom, whether democratic or authoritarian; and Ober's Reciprocal Categories Scale, RCS, (10) (A modification of the Flanders Interaction Scale) which gave evidence concerning the interactions taking place in the classroom; and by Solomon's Taxonomy of Image Provoking Behavior, TIPB (11) which

revealed the kinds and extent of image-provoking behavior used.

Results:

From the Systematic Observations of these tapes, it was shown that the DISCUS teachers, in comparison with the teachers of the non-treated groups were more experimental in their teaching, that they implemented the Dewey Philosophy in their teaching to a greater extent than did the others, that they talked much less and that their pupils talked much more, and that their pupils spent much more time busily engaged in meaningful laboratory work. Furthermore, the DISCUS teachers used much less abstract image-provoking behavior than the others, and much more of combined concrete and representational image-provoking behavior. The DISCUS teachers used mainly concrete image-provoking behavior while the others used primarily abstract image-provoking behavior. This difference we found to be an outstanding characteristic of the DISCUS teaching as compared with that in the non-treated groups.

Data from pre-tests and post-tests were analyzed using Applied Multivariate Linear Regression Techniques for use with computers developed by Battenberg, et. al. (12)

That the treated and non-treated groups were alike was established by comparing pre-test means on the Otis and the STEP tests. There were no significant differences between these groups. Actually the mean scores on the Otis test differed by only 0.2 of a point, and on the STEP test by less than a point.

A comparison of the mean scores on both the Otis and the STEP pre-tests and post-tests showed no significant changes in favor of either the treated or the non-treated groups.

The null hypotheses tested were:

1) That treatment makes no difference in the students' attitudes toward themselves, toward their peers, toward their teachers, or toward their school.

2) That grade makes no difference in the students' attitudes toward themselves, toward their peers, toward their teachers, or toward their school.

3) That race makes no difference in the students' attitudes toward themselves, toward their peers, toward their teachers, or toward their school.

4) That sex makes no difference in the students' attitudes toward themselves, toward their peers, toward their teachers, or toward their school.

5) That interactions among grade and race, grade and sex, grade and treatment, race and sex, race and treatment, and sex and treatment make no difference in the students' attitudes toward themselves, toward their peers, toward their teachers, or toward their school.

Data from the Battle Student Attitude Scale, the Projective Essays, and the Projective Interviews which were significant are arrayed in tables I, II, and III. The F scores are shown, and the probability of obtaining the values in the full model by random sampling from the populations in which the hypothesis is true is given. (Tables follow)

Table I — Significant results obtained from the analysis of student scores on the Battle Student Attitude Scale

Table II — Significant results obtained from the analysis of student scores on the Projective Essays

Table III — Significant results obtained from the analysis of student scores on the Projective Interviews

In order to gain a better idea of the effect of the various variables on attitudes toward self, peers, teachers, and the school, predicted adjusted mean scores were obtained for each variable being considered. These adjusted mean scores were then recorded as shown in table IV in nested variables within categories.

Table IV — Array Showing How Adjusted Means Were Recorded in Nested Variables Within Categories

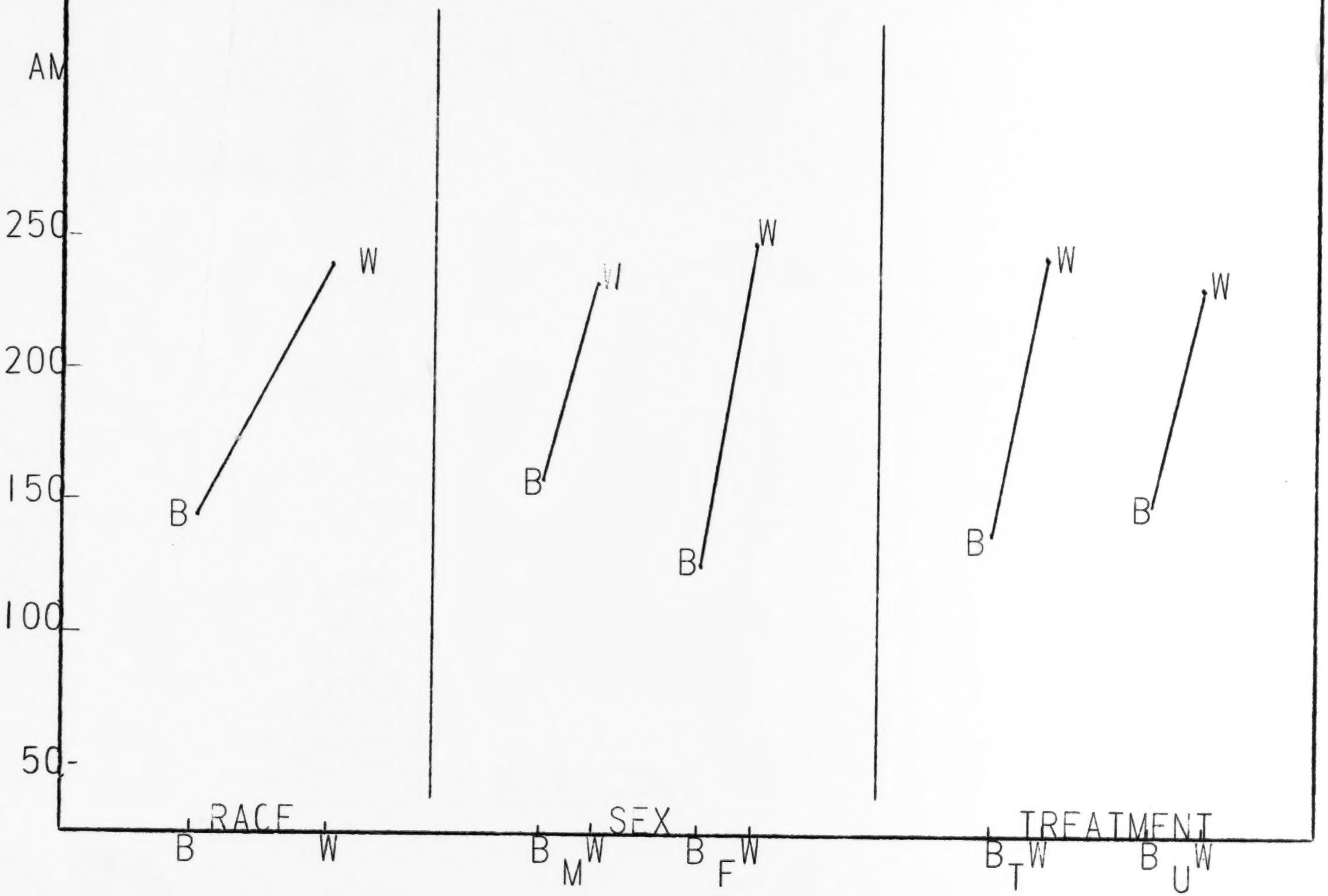
Only those changes which had been shown to be significant in tables I, II, and III were recorded. These adjusted means, which in reality are predicted mean scores attributable to the variable being considered, were then plotted on graphs for comparison. We shall present first the results obtained from the Battle Student Attitude Scale, and then, show the results of all three attitude scales combined on single graphs. It should be remembered that no data are presented in the graphs unless the probability of obtaining the values in the full model by random sampling from the populations in which the hypothesis applies is less than 0.05.

Graph 1 displays the influence of Race, Sex, and Treatment on attitude toward Self as reflected in the adjusted means predicted on the Battle Student Attitude Scale. In each respect white students have a much better attitude toward themselves than do black students. The difference in attitude between black students and white students is greater among females than among males, and among treated students than among untreated students.

Graph 2 displays the influence of Grade and Sex, Grade and Race, and Grade and Treatment on attitude toward Self as reflected in the adjusted means predicted on the Battle Student Attitude Scale. Both males and females have a better attitude toward themselves at the eighth grade level than at the seventh grade level. Perhaps this is attributable to the difficulty of adjusting to the junior high school at the seventh grade level. At the ninth grade level the males develop a slightly improved attitude toward themselves over what they had at the eighth grade level while the females show a marked decline. Perhaps this difference between male and female reflects an adjustment to their roles in heterosexual relationships.

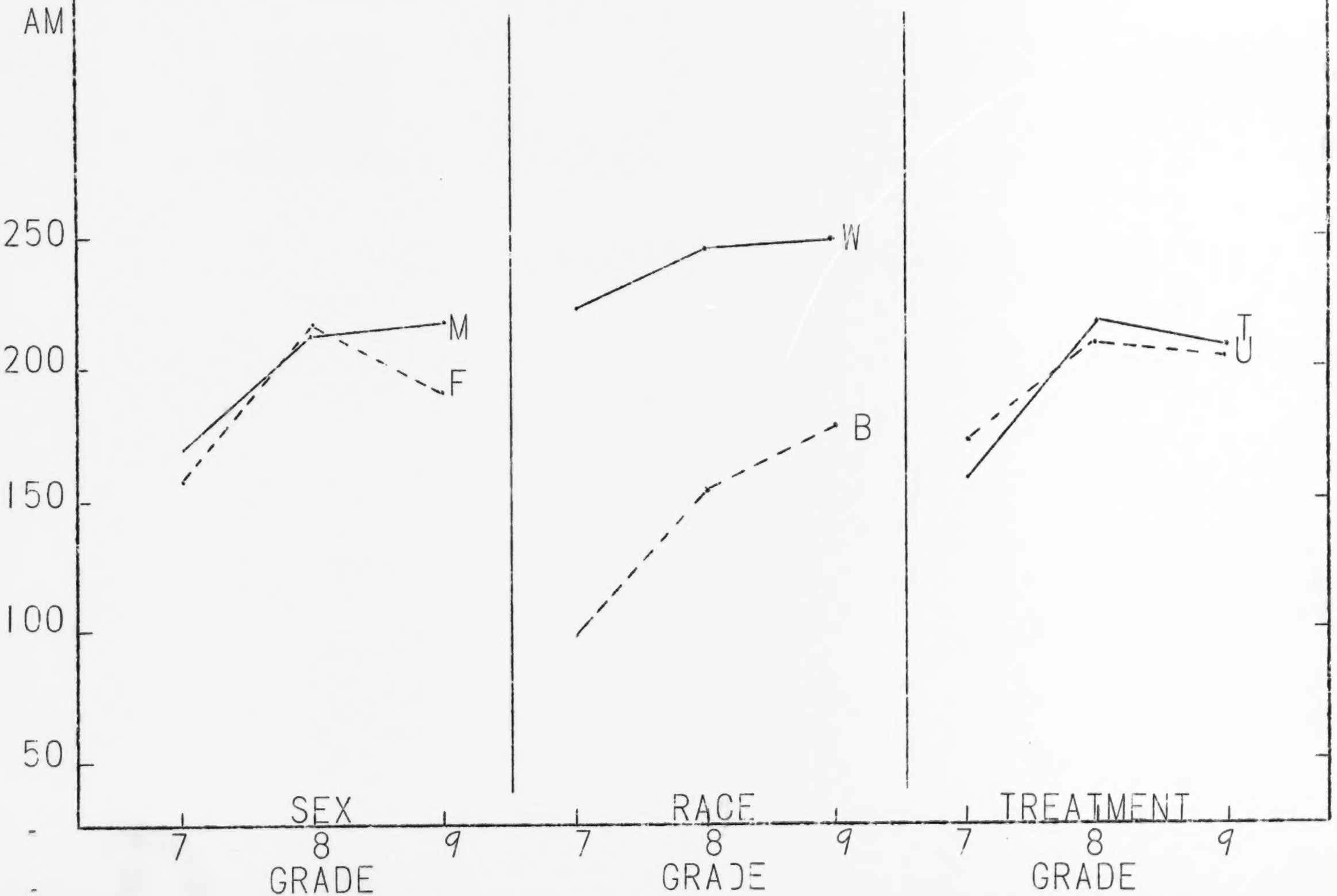
GRAPH 1

BSAS ADJUSTED SELF 1968-69



GRAPH 2

BSAS ADJUSTED MEANS SELF 1968-69



At each grade level white students have a much better attitude toward themselves than do black students. Even though students show increasingly greater gains in attitude toward themselves in the eighth and ninth grades, they never attain the self assurance level of white students. Perhaps this is related to the socio-economic environment in which they live.

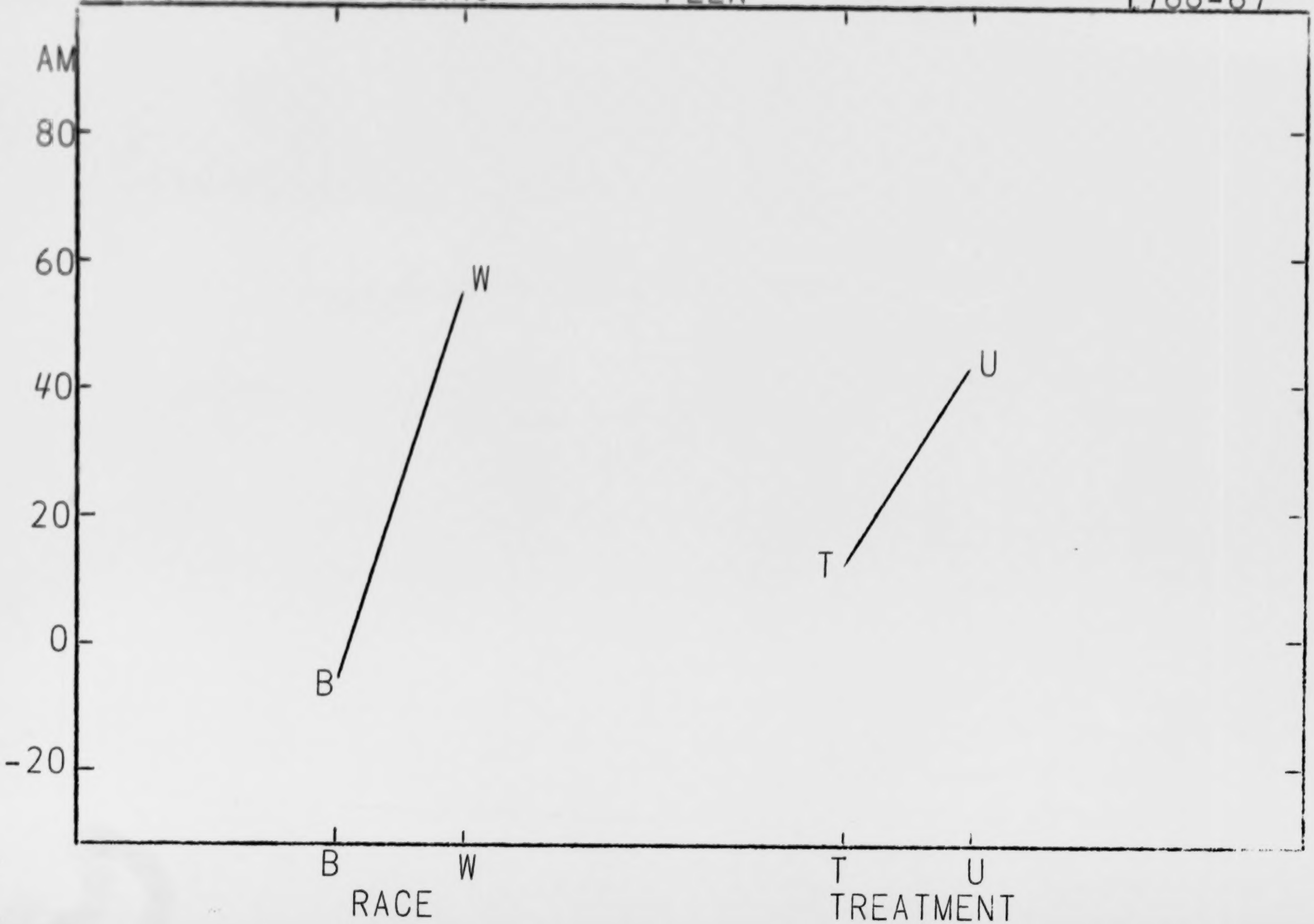
The influence of treatment is not as great as that of grade. The treated students have a slightly poorer self image at the seventh grade level than the untreated students and a slightly better self image at the eighth and ninth grade level. It may be that at the seventh grade level it is difficult to adjust to the emphasis on self direction at the seventh grade level, but that this adjustment is cumulative; and that the treated students in the eighth and ninth grades improve more in their attitudes toward themselves with continued DISCUS type of treatment.

Graph 3 displays the influence of Race and Treatment on attitude toward peers as reflected in the adjusted means predicted on the Battle Student Attitude Scale. White students have a much better attitude toward their peers than do black students. Perhaps again this difference is due to the socio-economic conditions under which these students live. The treated students have a much poorer attitude toward their peers than the untreated students. When one recalls that the sample studied is composed of economically deprived, educationally disadvantaged underachievers, then it is most likely that these students must be freed from the ties of their peer gangs if they are to improve in their attitudes toward their teachers and toward their school.

Graph 4 displays the influence of Treatment and Sex, Treatment and Race, and Race and Sex on attitude toward peers as reflected in the adjusted means predicted on the Battle Student Attitude Scale. For treatment and sex, there is little difference in sex responses, but the treated students have a much poorer attitude

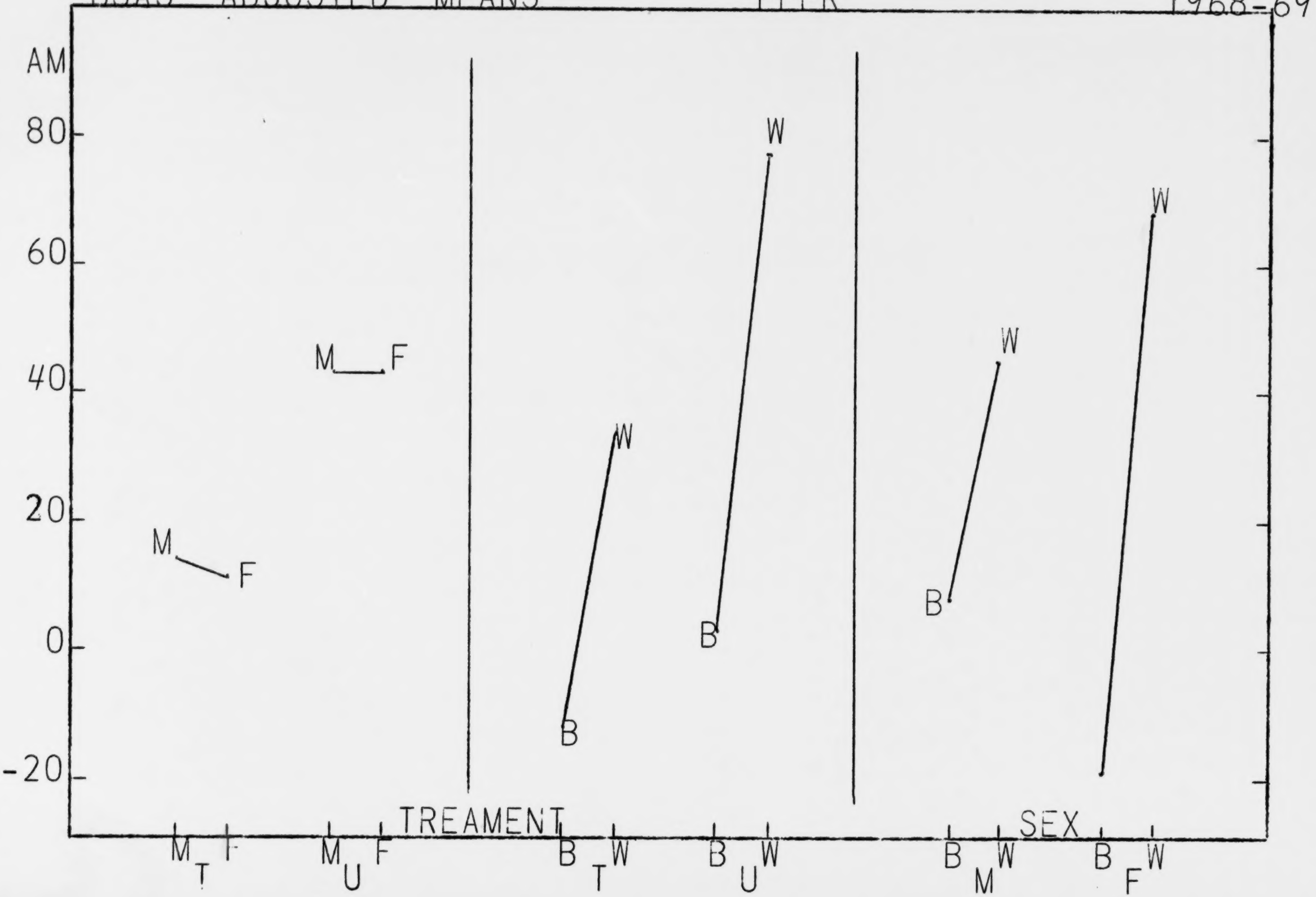
GRAPH 3

BSAS ADJUSTED MEANS PEER 1968-69



GRAPH 4

BSAS ADJUSTED MEANS PEER 1968-69



toward their peers. For treatment and race the black students have a much poorer attitude toward their peers than do the white students, and the treated students have a much poorer attitude toward their peers than do the untreated students. For race and sex the black students have a much poorer attitude toward their peers than do the white students. While the attitude of the white females toward their peers is better than that of the white males, the attitude of the black females is much poorer than the black males. Perhaps these latter differences are due to the differing socio-economic conditions between black and white students, and to the differing roles of males and females in these differing socio-economic conditions.

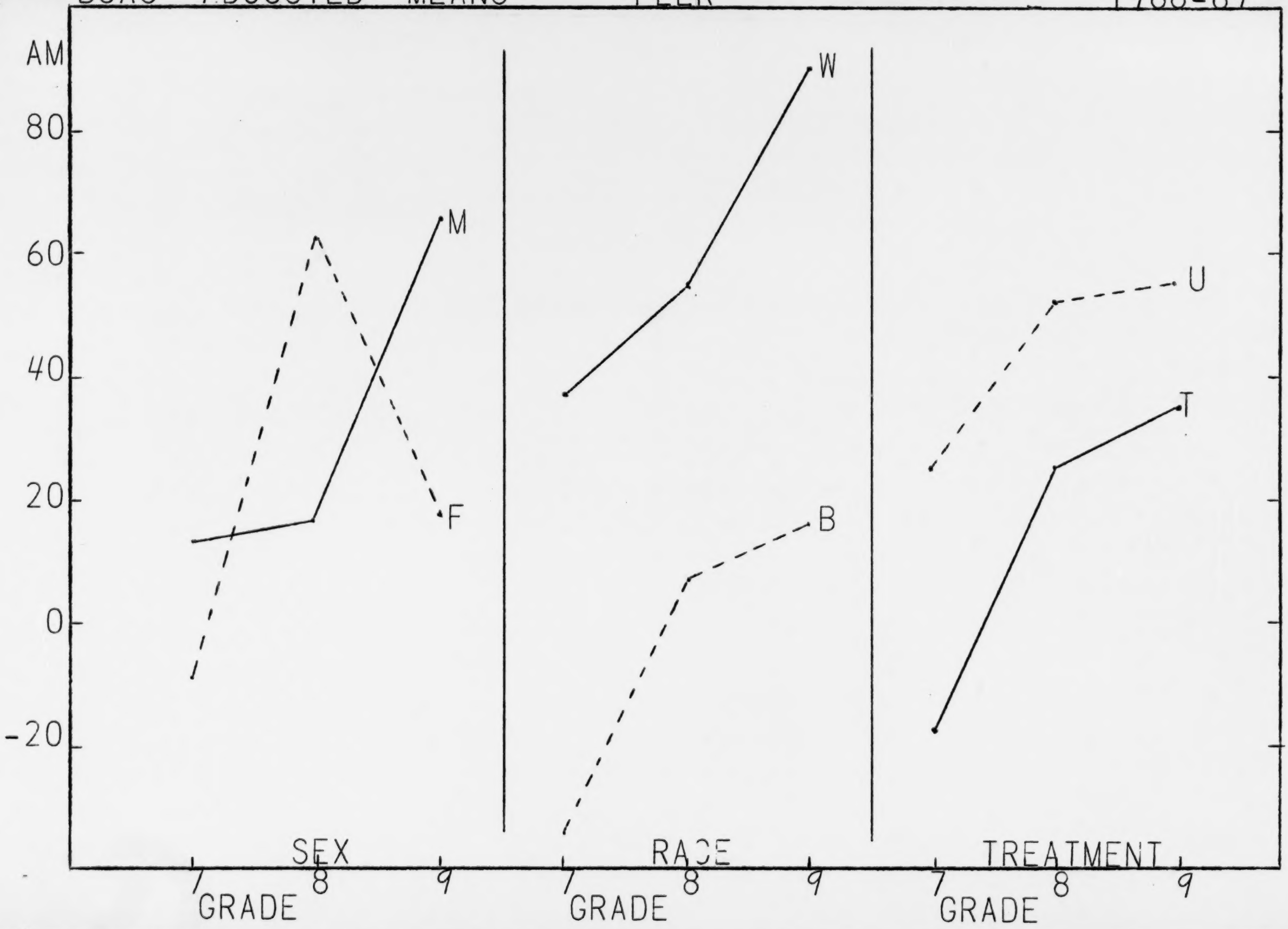
Graph 5 displays the influence of Sex, Race, and Treatment on attitude toward peers as reflected in the adjusted means perdicted on the Battle Student Attitude Scale. Note that the eighth grade females make a marked improvement in their attitude toward their peers as compared to seventh grade females, but that at the ninth grade the females again have a much less favorable attitude toward their peers. In contrast, the big gain in attitude toward their peers occur among males at the ninth grade level. Perhaps this is because of later maturation among males than females.

Surprisingly, black students have a much poorer attitude toward their peers than white students, though both white and black students gain a better atttitude toward their peers in both the eighth and ninth grades.

The untreated students consistently have a better attitude toward their peers than the treated students. This represents a desired result in that treatment does free these economically deprived, educationally disadvantaged underachievers from dependence on and alliance with their peers. Assuming the peer group tends to be alienated from the school, rejection of this group indicates a basis for acceptance of the school.

GRAPH 5

BSAS ADJUSTED MEANS PEER 1968-69



Graph 6 displays a combined influence of Race, Grade and Sex, and Grade and Race on attitude toward the teacher as reflected in the adjusted means predicted for the Battle Student Attitude Scale. The black students have a much better attitude toward their teachers than do the white students. This may reflect the socio-economic backgrounds of the students, or the quality or appropriateness of the leadership provided by the teachers.

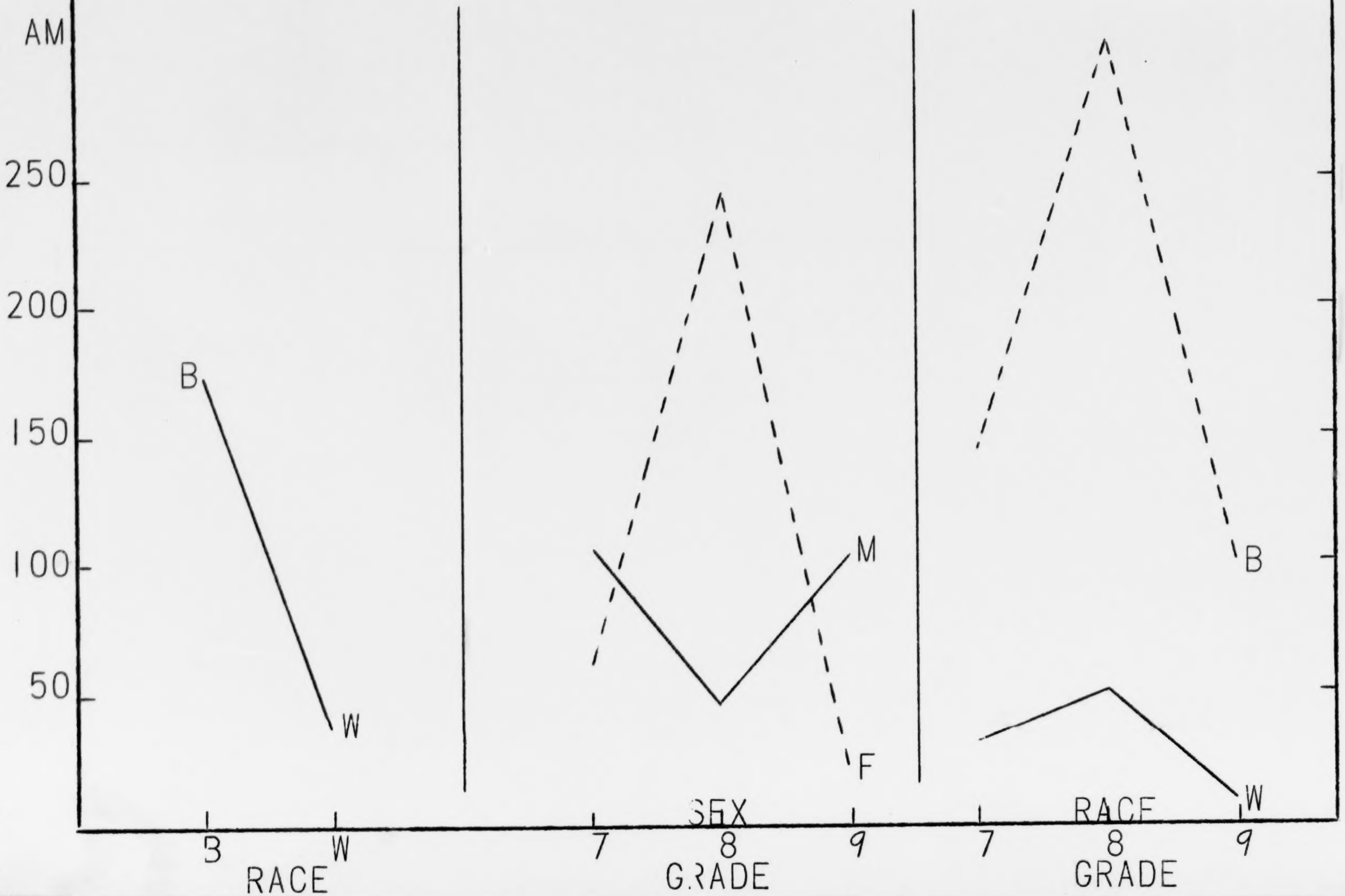
Note that the positive attitude toward the teachers for eighth grade females is much greater than at the 7th or 9th grade levels, while the reverse is true of the males, and that at the 9th grade level females end up with a poorer attitude toward the teacher than at the 7th grade level, and a poorer attitude than the males. Again it may be that these differences are largely due to the earlier maturity of the females to the males, and to an earlier identification with the teacher by the females.

At all levels the black students have a much more positive attitude toward their teachers than do white students. The very positive score of black students in attitude toward their teachers must in large measure be due to the attitude of the black females toward their teachers. Clearly, black students identify more closely with their teachers than do the white students. Probably the socio-economic differences between the black students and the white students, and the quality and appropriateness of the teaching have something to do with these attitudes.

Graph 7 displays the influences of Treatment and Grade on attitude toward the school. Why do these results contrast sharply with those in graph 6? Which measure shall we accept? We shall express an opinion. Knowing the enthusiasm of the teachers and of the principals for the DISCUS program, and having observed the obvious enthusiasm of the students, we were both surprised and disappointed that the analysis of the data from the Battle

GRAPH 6

BSAS ADJUSTED MEANS TEACHER 1968-69



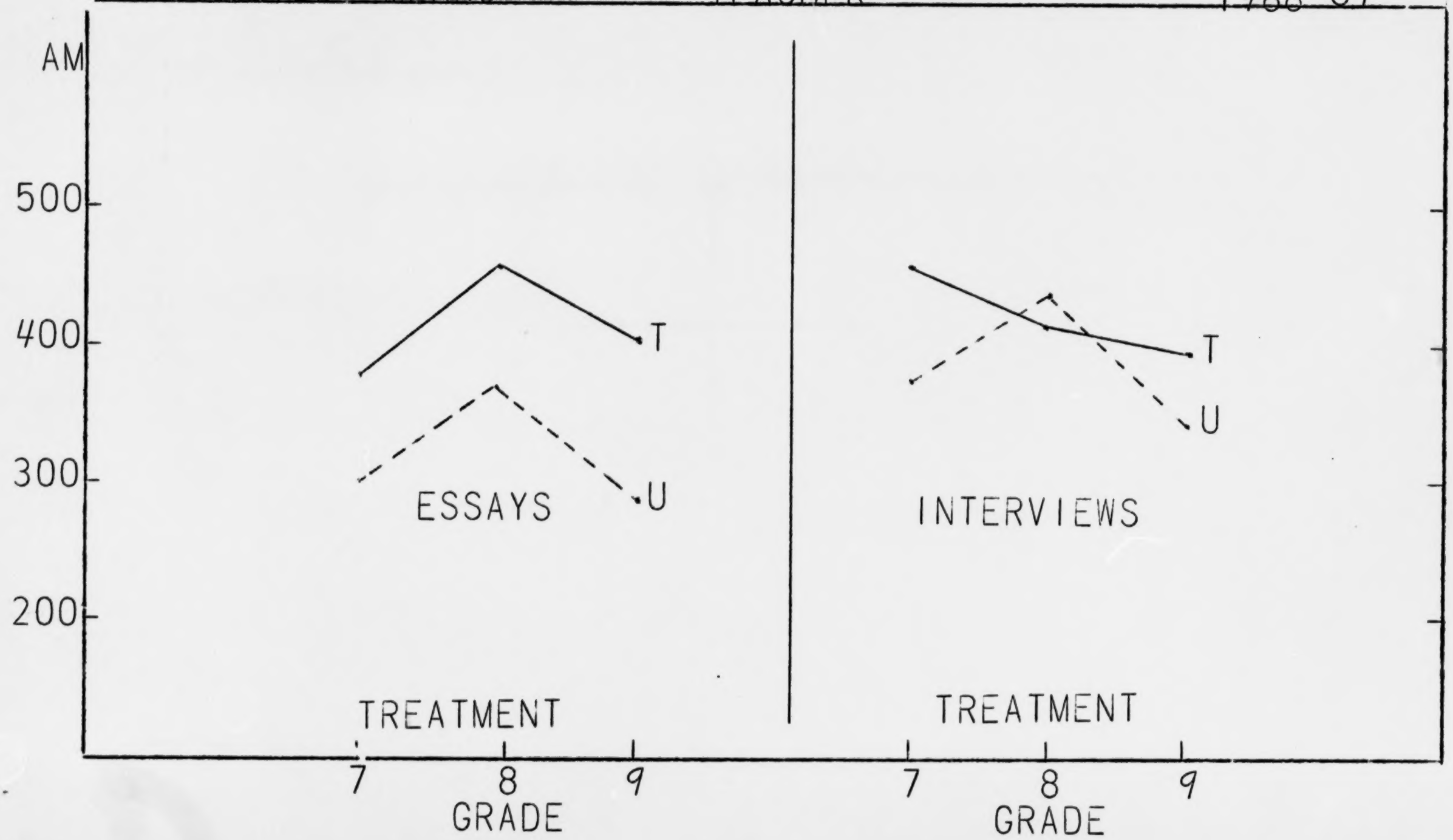
Student Attitude Scale using Applied Multivariate Linear Regression Techniques did not show a significant change in attitude toward the teachers due to treatment alone. Could it be there were no significant effects of treatment, or, was there some weakness in our research? Perhaps the Battle Student Attitude Scale does not really measure the attitude of a segment of our population. Perhaps there are cultural inhibitions that prevent our getting valid responses on a portion of the Battle Student Attitude Scale. (see graphs 6, 7, 8, and 9, 10, 11, 12)

On graph 6 we have seen the effects of grade and sex and of grade and race upon expressed attitudes towards the teacher. Note that the black females are much more positive in their attitudes than the others. Could it be that the members of this group in particular are not going to be critical of their teachers in any way, that they have been indoctrinated by their culture to believe that the way to get along in a white culture is to always compliment the whites, to always smile, so to speak? If this is the case, then the untreated black females, who have not been in a success-oriented situation, would be more suspicious than the treated black females and respond more according to their indoctrinated cultural patterns.

Graph 8 displays the influence of Treatment and Sex on attitude toward teacher as reflected in the adjusted means predicted for the Battle Student Attitude Scale. The females responded positively to treatment in attitude toward teachers while the males responded negatively. Perhaps the program is more appropriate for females than for males. There are more female teachers than male teachers. Female students mature more rapidly than male students. It could be that male students have had more concrete experiences than the female students. Whatever it is, the female students respond more favorably to the treatment than the male students.

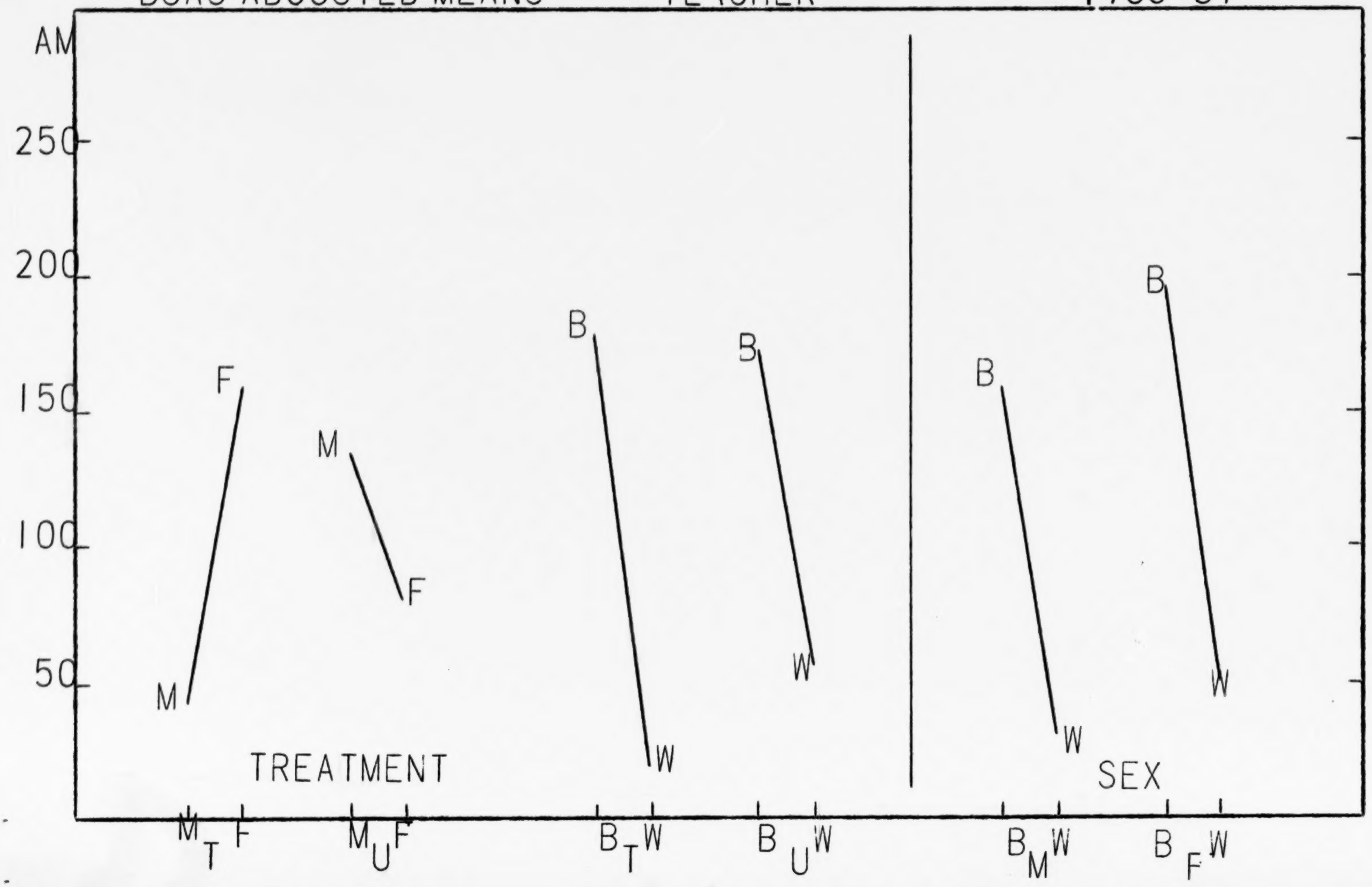
GRAPH 7

ADJUSTED MEANS TEACHER 1968-69



GRAPH 8

1968-69



The black students develop a far better attitude toward their teachers than the white students regardless of treatment, with the treated black students becoming more positive than the untreated black students, and with the untreated white students becoming more positive than the treated white students. Again, the program seems more appropriate for the black students than for the white students and it may be related to positive leadership exerted by the teachers, or to the past experiences of the students.

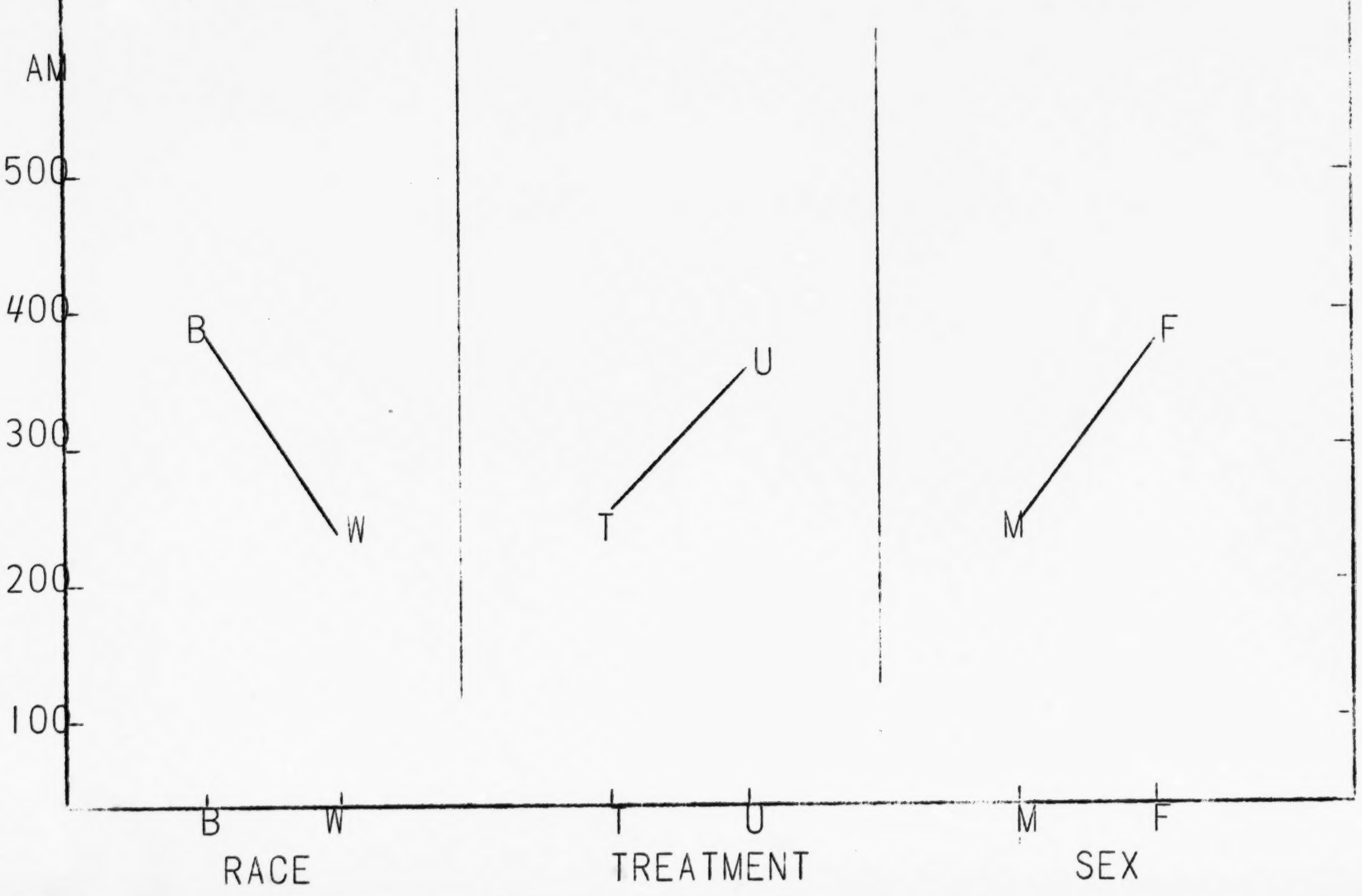
Black students of both sexes develop a more positive attitude toward their teachers than the white students and females of both races develop a better attitude toward their teacher than the males.

Graph 9 displays the influences of Race, Treatment, and Sex on attitudes toward the school as reflected in the adjusted means predicted for the Battle Student Attitude Scale. The black students have a better attitude toward the school than the white students, the untreated students have a better attitude than the treated students, and the females have a better attitude than the males. Possibly a Success-Oriented treatment in the DISCUS class makes the remainder of the student's environment even more dismal in comparison. It is more likely, however, that this result reflects a cultural inhibition as pointed out in the discussion of the attitudes of the female black untreated students in their attitudes toward their teachers.

Graph 10 displays the combined influences of Treatment and Sex, Treatment and Race, and Race and Sex on attitude toward the school as reflected in the adjusted means predicted for the Battle Student Attitude Scale. Regardless of treament the females have a more positive attitude toward the school than the males, and regardless of sex, the untreated students have a more positive attitude toward the school than the treated students.

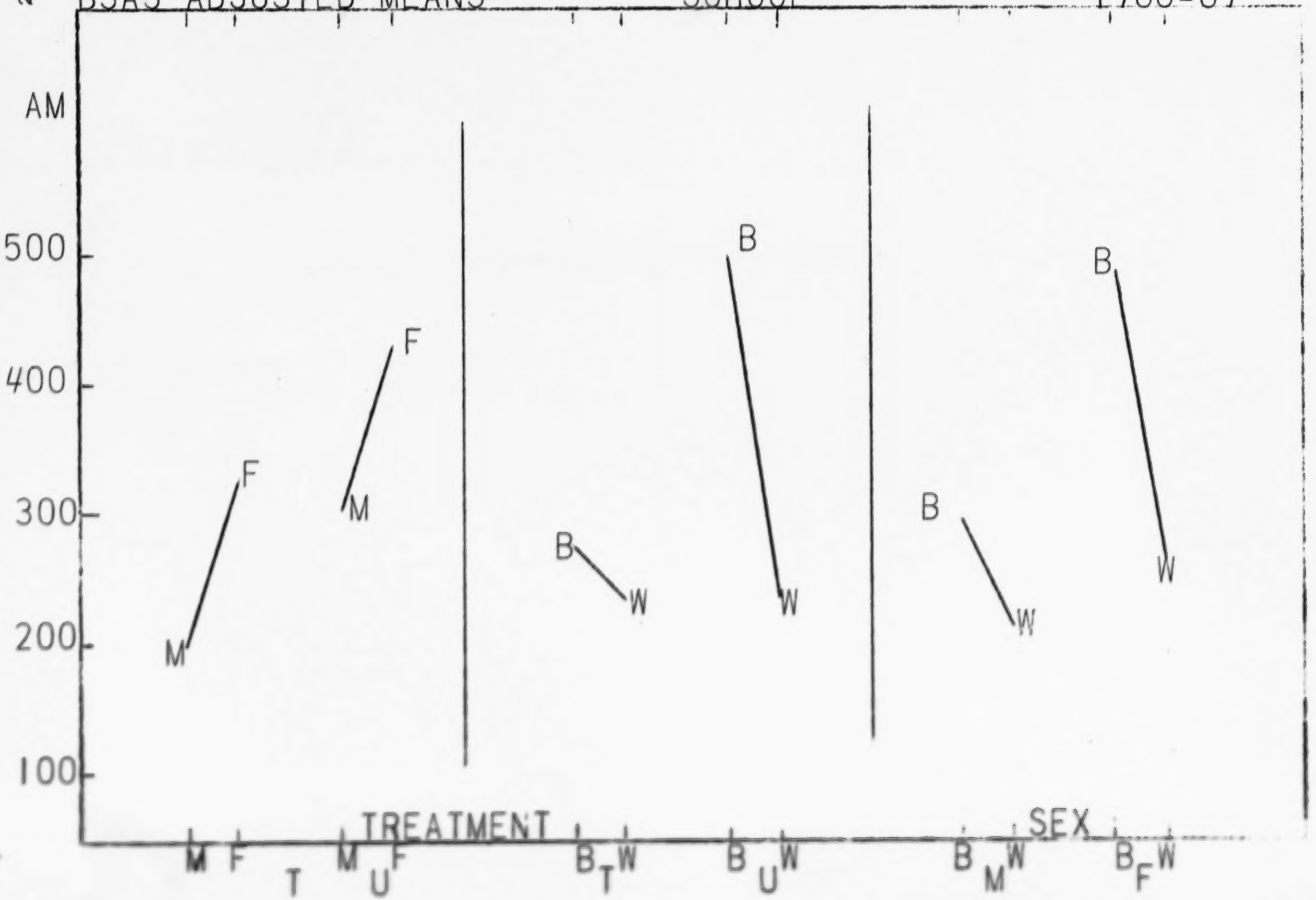
GRAPH 9

BSAS ADJUSTED MEANS SCHOOL 1968-69



GRAPH 10

BSAS ADJUSTED MEANS SCHOOL 1968-69



While the treated and nontreated white students develop essentially the same attitude toward the school the nontreated black students show a much better attitude then the treated black students. These differences appear to be due in large part to the attitude of the untreated black female students toward the school as compared to treated black female students. The majority of these differences appear to be due to the expressed attitude of the female black students toward their school. It could be that the untreated female black students were afraid to express any negative attitude toward the school, or it may be that these differences really exist.

Graph 11 displays the influence of Grade and Sex, Grade and Race, and Grade and Treatment on attitude toward the school as reflected in the adjusted means predicted for the Battle Student Attitude Scale. From these graphs it appears that the expressed attitude toward the school is much higher among the untreated, 8th grade, black, female students than among any of the others.

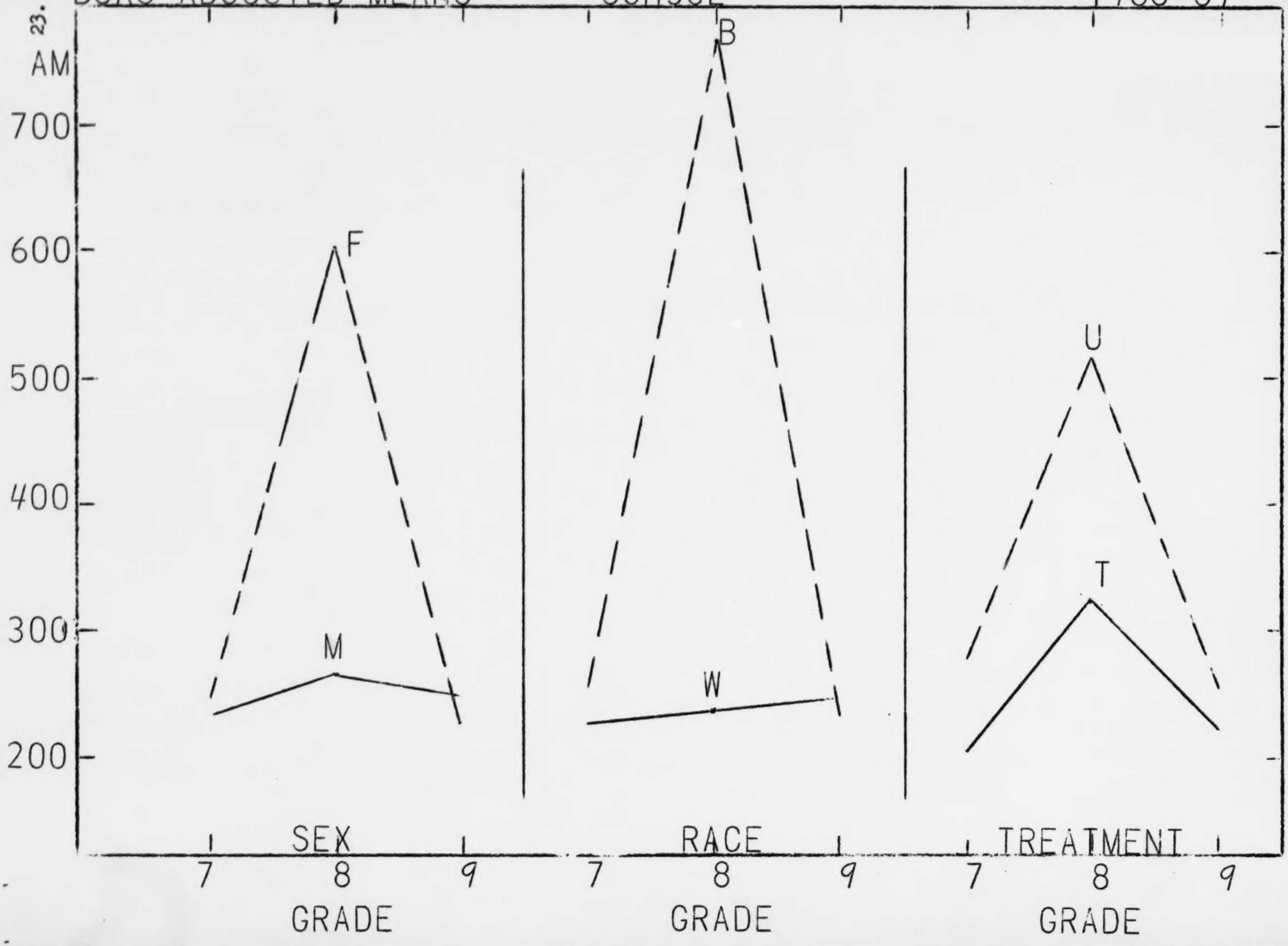
Graph 12 from the projective interviews shows that 7th and 9th treated groups had a better attitude toward the school than the untreated groups while the reverse was true at the 8th grade level. We believe that the cultural response of 8th grade, black, untreated females prevented obtaining a true measure of their attitudes toward the school on a written scale.

The remaining graphs compare significant results obtained on the three different measures of attitudes. It is interesting to note that in every case the three measures support each other except in comparing expressed attitudes toward the school with those measured by indirect means.

Graph 13 displays the influence of race upon attitudes toward Self, Peers, Teacher, and School.

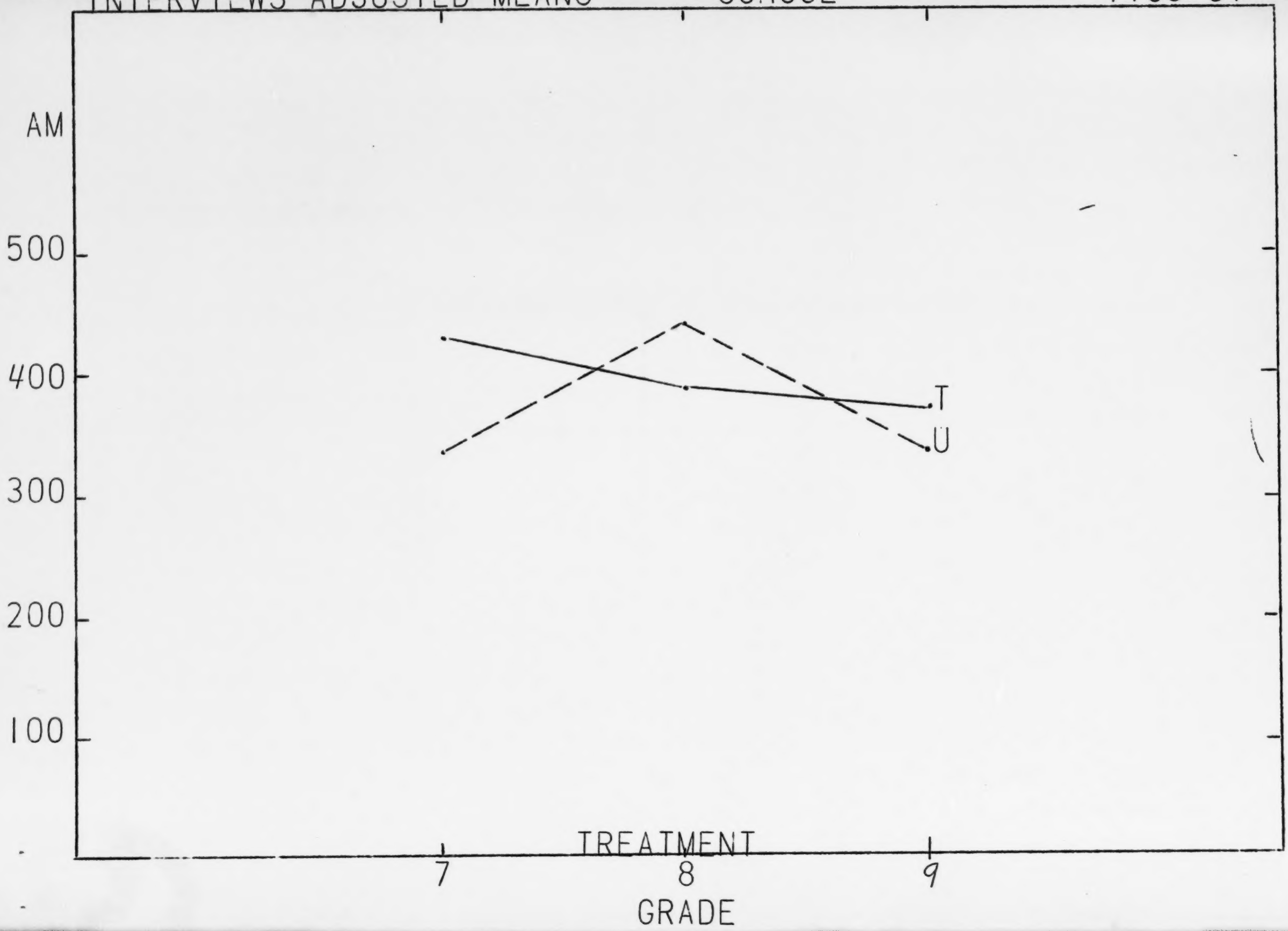
Graph 14 displays the influence of Treatment and Grade upon attitude toward Self, Teacher, and School. It should be noted that the expressed

BSAS ADJUSTED MEANS SCHOOL GRAPH 11 1968-69



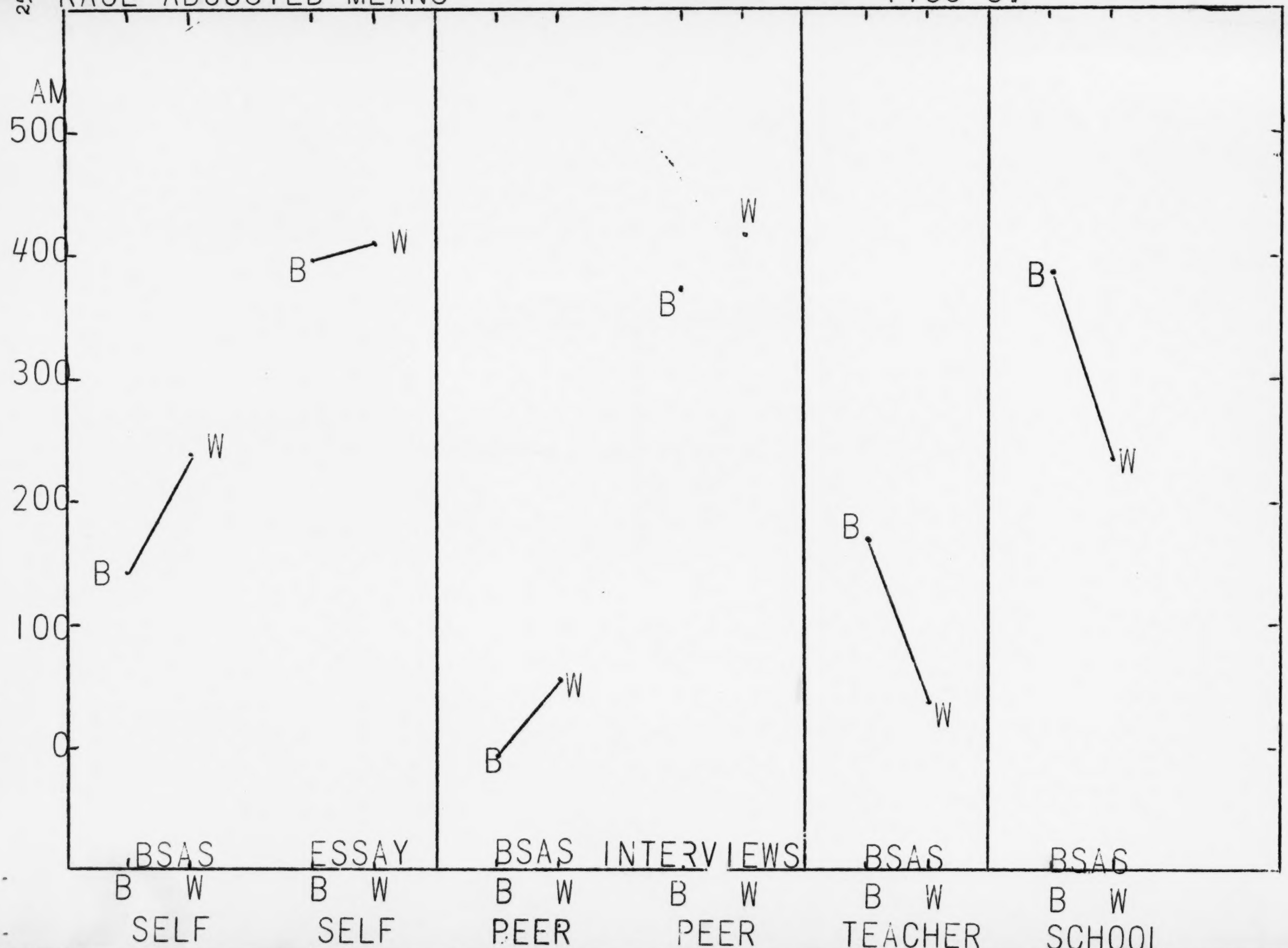
GRAPH 12

INTERVIEWS ADJUSTED MEANS SCHOOL 1968-69



GRAPH 13

RACE ADJUSTED MEANS 1968-69



attitude toward the school reflected in the adjusted means predicted for the Battle Student Attitude Scale are considerably different than those obtained from the Projective Interviews.

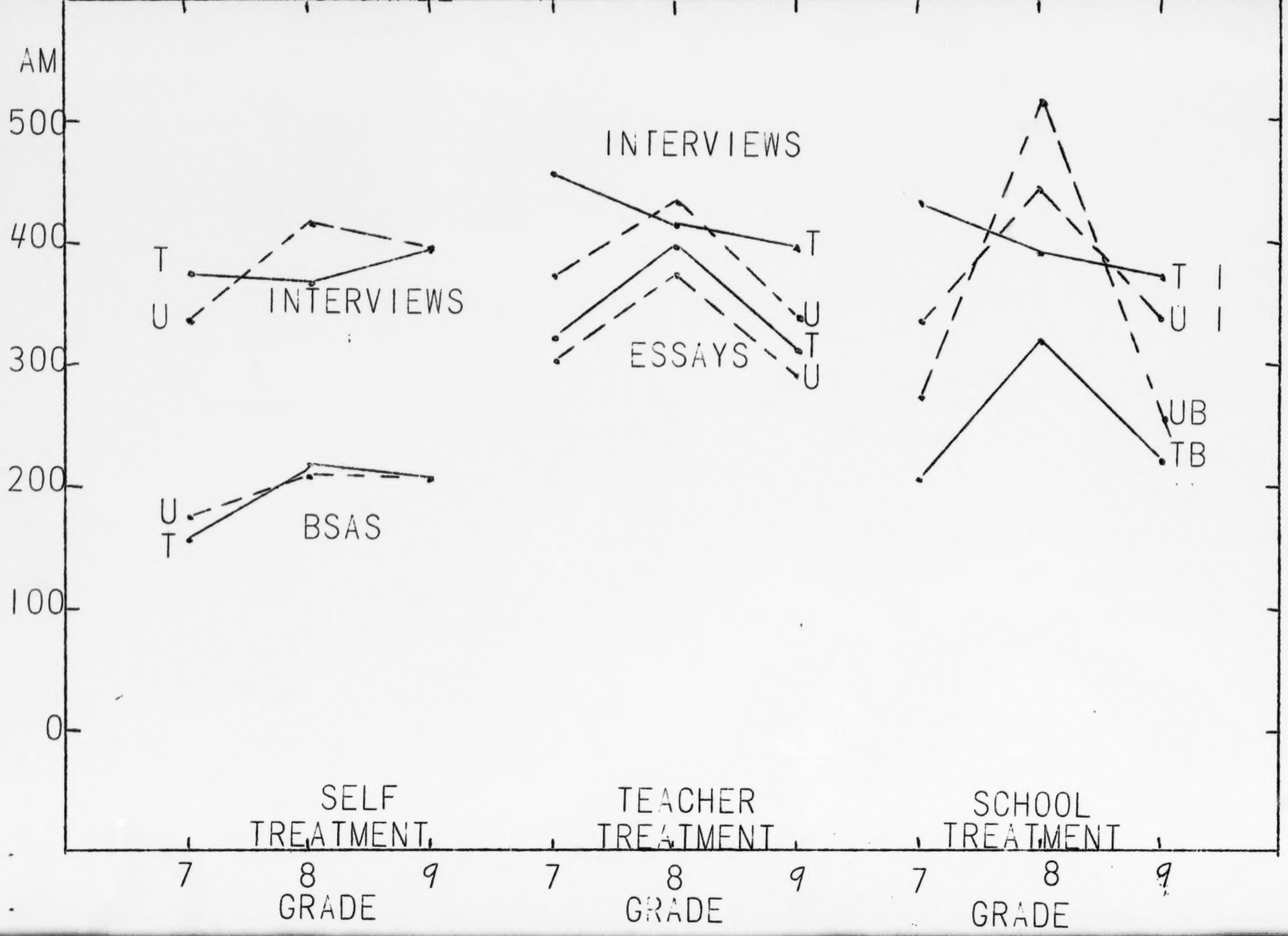
Graph 15 displays the influence of Race and Grade on attitude toward Self and towards the Peers.

Graph 16 displays the influence of Race and Grade upon the attitudes toward the teacher and towards the school. Note that the expressed attitudes of the 8th grade black students toward their teachers and toward their school deviates greatly from the results obtained on the projective tests. The researchers tend to believe that the attitudes expressed by the 8th grade, untreated, black females on the written Battle Student Attitude Scale does not, in fact, represent their true attitude; that they are suspicious of the test and try to answer it in ways they think their teacher would like to have them answer; that they dare not reveal their true attitude in writing.

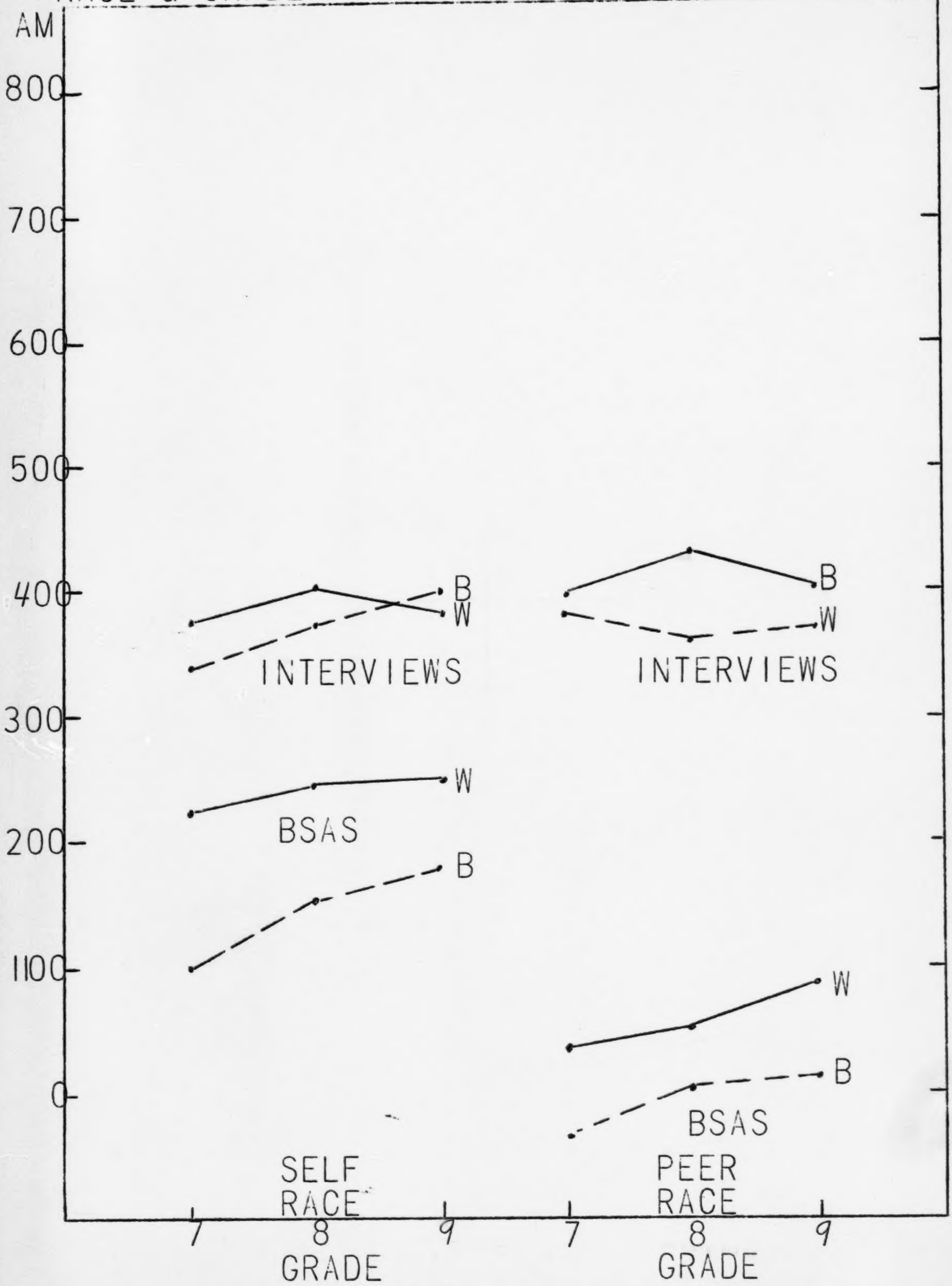
Graph 17 displays the influence of Sex and Grade on attitudes toward Self, Peers, and Teachers.

Graph 18 displays the influences of Race and Sex on attitudes toward Peers.

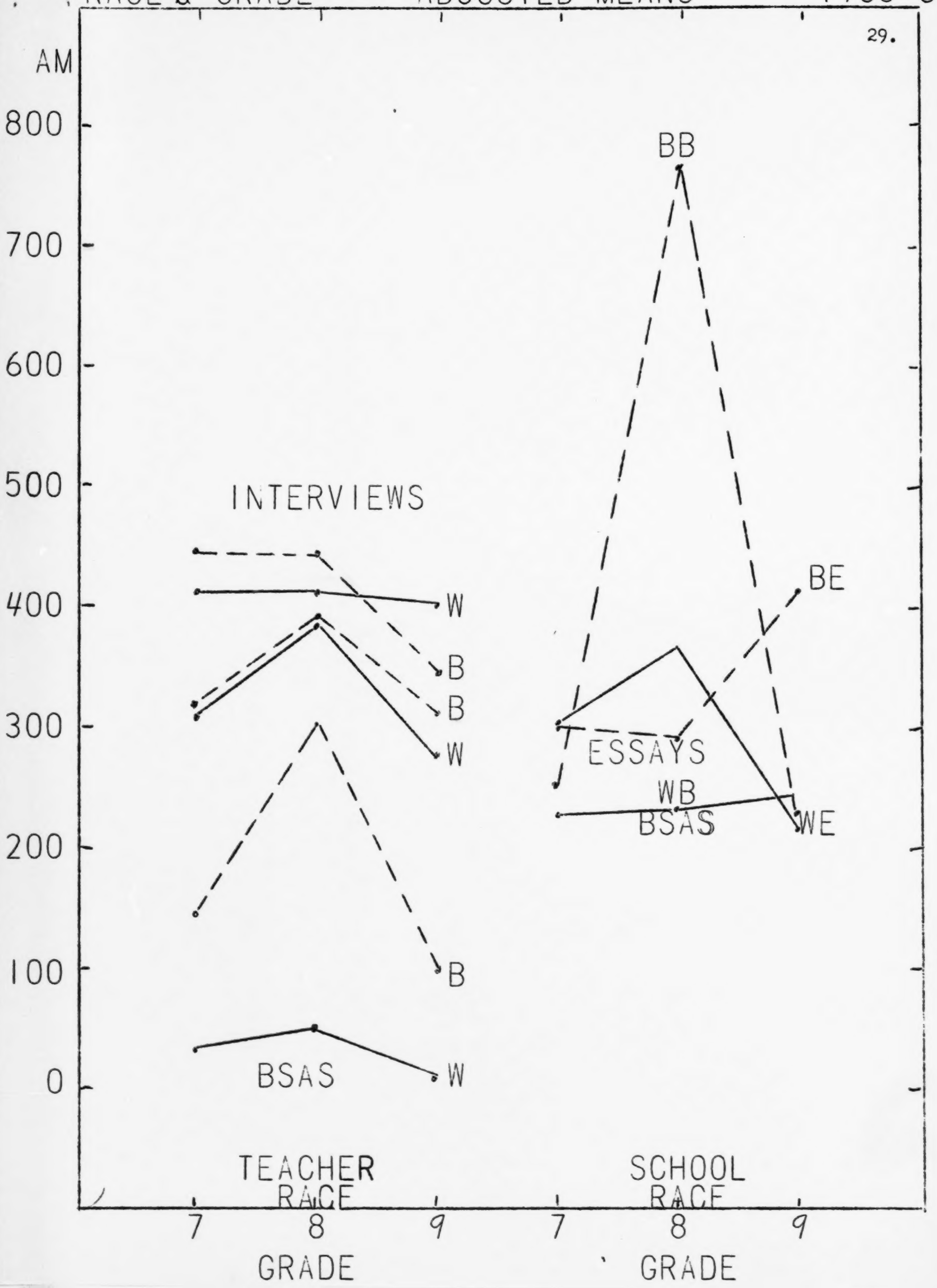
TREATMENT AND GRADE ADJUSTED MEANS GRAPH 14 1968-69



RACE & GRADE ADJUSTED MEANS 1968-69

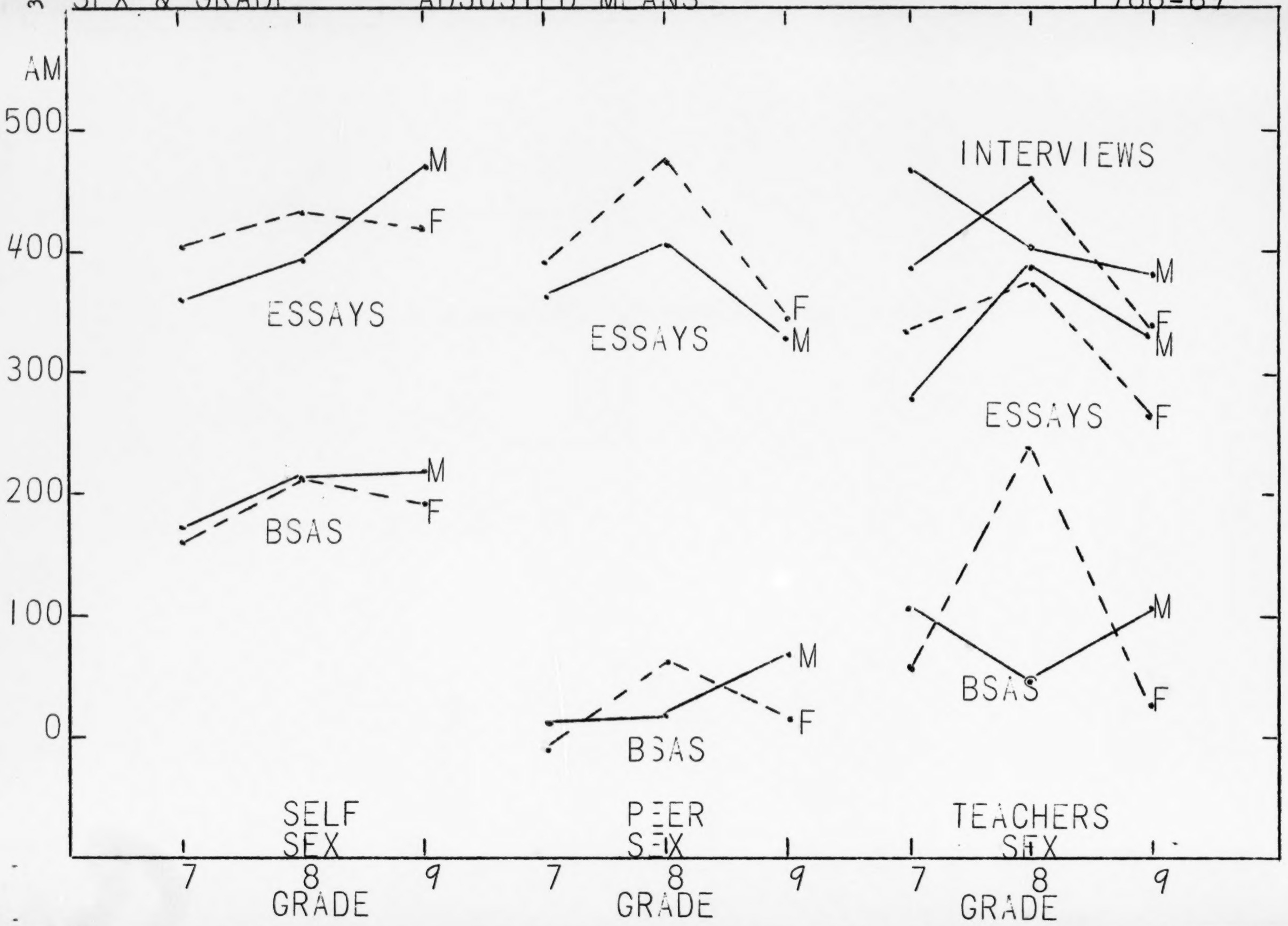


RACE & GRADE ADJUSTED MEANS 1968-69



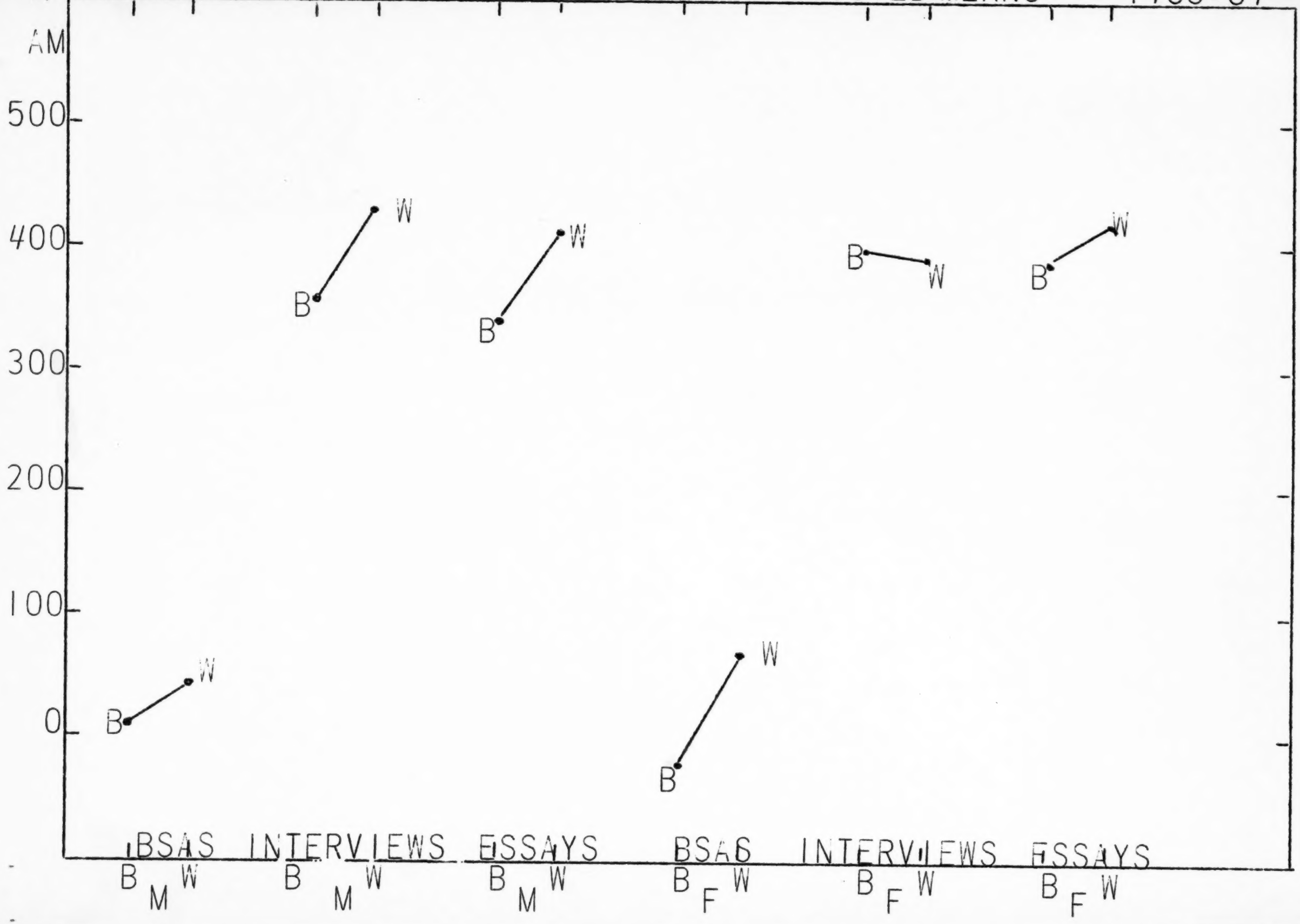
GRAPH 17

30. SEX & GRADE ADJUSTED MEANS 1968-69



GRAPH 18

31. RACE & SEX - ATITUDE TOWARD PEER ADJUSTED MEANS 1968-69



SUMMARY

To what extent were the hypotheses accepted or rejected?

Hypothesis 1: That treatment makes no difference in the students' attitude toward themselves was accepted; that treatment makes no difference in the students' attitude toward their peers was not accepted (the untreated students were more identified with their economically deprived, educationally disadvantaged peer groups-see graph 3); that treatment makes no difference in the students' attitudes toward their teachers was not accepted in the light of the projective tests (see graph 7); that treatment makes no difference in the students' attitude toward their school was not accepted. (See graphs 9, 10, 11, and 12.)

What evidence have we from the Projective Essays and from the Projective Interviews? In graph 7 from the projective essays we see that the treated students show a more positive attitude toward their teachers than do the untreated students. From the projective interviews, we see this is also true at both the 7th and 9th grade levels, but not at the 8th grade level. Perhaps in the interviews, the untreated black females were careful to say complimentary things to the white interviewers, while at the 7th and 9th grade levels they were not so cautious. To us, the analyses of the projective interviews supports the hypothesis that such treatment as provided in the DISCUS program does, in fact, improve the students' attitudes toward their teachers.

Hypothesis 2: That grade makes no difference in the students' attitudes toward themselves was not accepted. (see graph 2); in attitudes toward their peers was not accepted (graph 5); in attitude toward their teachers was not accepted (graph 7); in attitudes toward their school was not accepted (graph 11).

Hypothesis 3: That race makes no difference in the students' attitudes toward themselves was not accepted (see graphs 1 and 13); in attitudes toward their peers was not accepted (see graphs 3 and 13); in attitudes toward their teachers was not accepted (see graphs 6 and 13); in attitudes toward their school was not accepted (see graphs 9 and 13).

Hypothesis 4: That sex makes no difference in the students' attitudes toward themselves was accepted; in attitudes toward their peers was accepted; in attitudes toward their teachers was accepted; and in attitudes towards their school was not accepted (see graph 9).

Hypothesis 5: That the interactions of various factors make no difference in

1. attitudes toward self:
   a) combined effects of grade and race were not accepted (see graphs 2 & 15)
   b) combined effects of grade and sex were not accepted (see graphs 2 & 17)
   c) combined effects of grade and treatment were not accepted (see graphs 2 & 14)
   d) combined effects of race and sex were not accepted (see graphs 1 & 13)
   e) combined effects of race and treatment were not accepted (see graphs 1 & 10)
   f) combined effects of sex and treatment were accepted.
2. attitudes toward peers:
   a) combined effects of grade and race were not accepted (see graphs 5 & 15)
   b) combined effects of grade and sex were not accepted (see graphs 5 & 17)
   c) combined effects of grade and treatment were not accepted (see graph 5)
   d) combined effects of race and sex were not accepted (see graphs 4 & 18)
   e) combined effects of race and treatmentwere not accepted (see graph 4)
   f) combined effects of sex and treatment were not accepted (see graph 4)

3. attitudes toward teachers:

   a) combined effects of grade and race were not accepted (see graphs 6 & 16)

   b) combined effects of grade and sex were not accepted (see graphs 6 & 15)

   c) combined effects of grade and treatment were not accepted (see graph 7)

   d) combined effects of race and sex were not accepted (see graph 8)

   e) combined effects of race and treatment were not accepted (see graph 8)

   f) combined effects of sex and treatment were not accepted (see graph 8)

4. attitudes toward the school:

   a) combined effects of grade and race were not accepted (see graphs 11 # 16)

   b) combined effects of grade and sex were not accepted (see graphs 11 & 17)

   c) combined effects of grade and treatment were not accepted (see graphs 11 & 14.)

   d) combined effects of race and sex were not accepted (see graph 10)

   e) combined effects of race and treatment were not accepted (see graph 10)

   f) combined effects of sex and treatment were not accepted (see graph 10)

ADDENDUM

That treatment makes no difference in the students' attitudes toward their teachers was indicated in the analysis of the Battle Student Attitude Scale. However, results from the projective tests and our awareness of the cultural inhibitions that apply, particularly to the female, black students, leads us to believe that there probably is a difference in favor of the treated students.

This research is far from complete. We are continuing work with the same groups of students and teachers this year in-so-far as desegregation guidelines permit. We shall use the same measures as reported herein but shall focus our attention on those students we can follow for two years. Since most of the teachers of experimental groups will have had training through participation in a Cooperative College-School Science Improvement Program, we shall expect even more positive results than are reported here.

Because of the cultural inhibitions encountered in this study, we shall search for additional projective techniques to use in our analyses. One such technique that offers some promise is the Q-Sort technique discussed by Stephenson. (13)

It will also be interesting to explore any changes in attitudes related to the extensive interchange of black and white teachers as a result of implimentation of desegregation guidelines at mid-year.

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TABLE I

BATTLE STUDENT ATTITUDE SCALE

ANALYSIS GROUP IDENTIFICATION	SELF		PEER		TEACHER		SCHOOL	
	F	Prob.	F	Prob.	F..	Prob.	F	Prob.
BY GRADE (G)	4.2090	.016830	23.3601	.000001			8.4387	.000319
RACE (R)	32.7691	.000001	49.3448	.000001	12.2395	.000637	13.0103	.000431
SEX (S)							8.4879	.004324
TMT (T)			31.1206	.000001			6.3158	.013431
G & R	9.1287	.000001	15.4192	.000001	4.1299	.001340	14.8095	.000001
G & S	2.5137	.030729	11.4459	.000001	2.3579	.040745	8.0013	.000001
G & T	4.1903	.006961	13.2684	.000001			5.2309	.000137
R & S	3.3051	.021703	9.2556	.000008	4.5487	.004344	5.3665	.001484
R & T	20.9090	.000001	27.7506	.000001	5.8664	.000762	11.0597	.000001
S & T			10.6432	.000001	2.6788	.047702	5.0191	.002350

THE PROBABILITIES OF OBTAINING THE VALUES IN THE FULL MODEL BY RANDOM SAMPLING FROM POPULATIONS IN WHICH THE HYPOTHESES ARE TRUE.

TABLE II

PROJECTIVE ESSAY

ANALYSIS GROUP IDENTIFICATION	SELF		PEER		TEACHER		SCHOOL	
	F	Prob.	F	Prob.	F	Prob.	F	Prob.
BY GRADE (G)	4.6490	.012811	3.5648	.033709	6.2029	.003354		
RACE (R)	4.0481	.048128						
SEX (S)								
TMT (T)								
G & R	3.0130	.016565	2.7959	.023882	3.1434	.013299	3.7158	.005090
G & S	2.3262	.052553	3.5635	.006567	4.1779	.002362		
G & T					2.5953	.033473		
R & S			3.0298	.035330				
R & T								
S & T								

THE PROBABILITIES OF OBTAINING THE VALUES IN THE FULL MODEL BY RANDOM SAMPLING FROM POPULATIONS IN WHICH THE HYPOTHESES ARE TRUE.

TABLE III

PROJECTIVE INTERVIEWS

ANALYSIS GROUP IDENTIFICATION	SELF		PEER		TEACHER		SCHOOL	
	F	Prob.	F	Prob.	F	Prob.	F	Prob.
BY GRADE (G)					4.6517	.012781		
RACE (R)			5.9844	.016986				
SEX (S)								
TMT (T)								
G & R	2.3445	.050977	2.6496	.030550	2.6595	.03005		
G & S					4.6631	.00107		
G & T	2.4375	.043623			4.1543	.00246	2.6497	.030545
R & S			5.2066	.003343				
R & T								
S & T								

THE PROBABILITIES OF OBTAINING THE VALUES IN THE FULL MODEL BY RANDOM SAMPLING FROM POPULATIONS IN WHICH THE HYPOTHESES ARE TRUE.

TABLE IV - FORMAT FOR DATA ANALYSIS

SELF						PEER						TEACHER						SCHOOL					
7th		8th		9th		7th		8th		9th		7th		8th		9th		7th		8th		9th	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B
T	U	T	U	T	U	T	U	T	U	T	U	T	U	T	U	T	U	T	U	T	U	T	U
W		B				W		B				W		B				W		B			
T		U				T		U				T		U				T		U			
M	F	M	F			M	F	M	F			M	F	M	F			M	F	M	F		
W	B	W	B			W	B	W	B			W	B	W	B			W	B	W	B		
M		F				M		F				M		F				M		F			
W	B	W	B			W	B	W	B			W	B	W	B			W	B	W	B		

DATA FROM THE VARIOUS ATTITUDE SCALES WERE ORGANIZED FOR ANALYSIS BY MULTI LINEAR REGRESSION TECHNIQUES AS SHOWN ABOVE.